

# SEQUENCE LISTING

<110> Masateru YAMADA  
 Hajimu KURUMATANI  
 Tetsuo SUDO

<120> REMEDY OR PREVENTIVE FOR KIDNEY DISEASE AND METHOD OF DIAGNOSING KIDNEY DISEASE

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<140> US 10/523,689  
 <141> 2005-02-03

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| att atg cac aga gat gtc aag ccc cat aat gtc atg att gat cat gag<br>Ile Met His Arg Asp Val Lys Pro His Asn Val Met Ile Asp His Glu<br>155 160 165     |     |     |     | 654  |
| cac aga aag cta cga cta ata gac tgg ggt ttg gct gag ttt tat cat<br>His Arg Lys Leu Arg Leu Ile Asp Trp Gly Leu Ala Glu Phe Tyr His<br>170 175 180     |     |     |     | 702  |
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| tgg agt ttg ggt tgt atg ctg gca agt atg atc ttt cgg aag gag cca<br>Trp Ser Leu Gly Cys Met Leu Ala Ser Met Ile Phe Arg Lys Glu Pro<br>220 225 230     |     |     |     | 846  |
| ttt ttc cat gga cat gac aat tat gat cag ttg gtg agg ata gcc aag<br>Phe Phe His Gly His Asp Asn Tyr Asp Gln Leu Val Arg Ile Ala Lys<br>235 240 245     |     |     |     | 894  |
| gtt ctg ggg aca gaa gat tta tat gac tat att gac aaa tac aac att<br>Val Leu Gly Thr Glu Asp Leu Tyr Asp Tyr Ile Asp Lys Tyr Asn Ile<br>250 255 260     |     |     |     | 942  |
| gaa tta gat cca cgt ttc aat gat atc ttg ggc aga cac tct cga aag<br>Glu Leu Asp Pro Arg Phe Asn Asp Ile Leu Gly Arg His Ser Arg Lys<br>265 270 275     |     |     |     | 990  |
| cga tgg gaa cgc ttt gtc cac agt gaa aat cag cac ctt gtc agc cct<br>Arg Trp Glu Arg Phe Val His Ser Glu Asn Gln His Leu Val Ser Pro<br>280 285 290 295 |     |     |     | 1038 |
| gag gcc ttg gat ttc ctg gac aaa ctg ctg cga tat gac cac cag tca<br>Glu Ala Leu Asp Phe Leu Asp Lys Leu Leu Arg Tyr Asp His Gln Ser<br>300 305 310     |     |     |     | 1086 |
| cgg ctt act gca aga gag gca atg gag cac ccc tat ttc tac act gtt<br>Arg Leu Thr Ala Arg Glu Ala Met Glu His Pro Tyr Phe Tyr Thr Val<br>315 320 325     |     |     |     | 1134 |
| gtg aag gac cag gct cga atg ggt tca tct agc atg cca ggg ggc agt<br>Val Lys Asp Gln Ala Arg Met Gly Ser Ser Ser Met Pro Gly Gly Ser<br>330 335 340     |     |     |     | 1182 |
| acg ccc gtc agc agc gcc aat atg atg tca ggg att tct tca gtg cca<br>Thr Pro Val Ser Ser Ala Asn Met Met Ser Gly Ile Ser Ser Val Pro<br>345 350 355     |     |     |     | 1230 |

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| 360 365 370 375   |      |
| gcc aac ccc ctt ggg atg cct gtt cca gct gcc gct ggc gct cag cag   | 1326 |
| Ala Asn Pro Leu Gly Met Pro Val Pro Ala Ala Ala Gly Ala Gln Gln   |      |
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| Gln Asp Asp Tyr Gln Leu Val Arg Lys Leu Gly Arg Gly Lys Tyr Ser |     |
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| Glu Val Phe Glu Ala Ile Asn Ile Thr Asn Asn Glu Arg Val Val Val |     |
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| aaa atc ctg aag cca gtg aag aaa aag aag ata aaa cga gag gtt aag | 415 |
| Lys Ile Leu Lys Pro Val Lys Lys Lys Lys Ile Lys Arg Glu Val Lys |     |
| 70 75 80  |     |
| att ctg gag aac ctt cgt ggt gga aca aat atc att aag ctg att gac | 463 |
| Ile Leu Glu Asn Leu Arg Gly Gly Thr Asn Ile Ile Lys Leu Ile Asp |     |
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| act gta aag gac ccc gtg tca aag aca cca gct ttg gta ttt gaa tat | 511 |
| Thr Val Lys Asp Pro Val Ser Lys Thr Pro Ala Leu Val Phe Glu Tyr |     |
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| Ile Asn Asn Thr Asp Phe Lys Gln Leu Tyr Gln Ile Leu Thr Asp Phe |     |
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| gat atc cgg ttt tat atg tat gaa cta ctt aaa gct ctg gat tac tgc | 607 |
| Asp Ile Arg Phe Tyr Met Tyr Glu Leu Leu Lys Ala Leu Asp Tyr Cys |     |
| 135 140 145   |     |
| cac agc aag gga atc atg cac agg gat gtg aaa cct cac aat gtc atg | 655 |
| His Ser Lys Gly Ile Met His Arg Asp Val Lys Pro His Asn Val Met |     |
| 150 155 160   |     |
| ata gat cac caa cag aaa aag ctg cga ctg ata gat tgg ggt ctg gca | 703 |
| Ile Asp His Gln Gln Lys Lys Leu Arg Leu Ile Asp Trp Gly Leu Ala |     |
| 165 170 175 180   |     |
| gaa ttc tat cat cct gct cag gag tac aat gtt cgt gta gcc tca agg | 751 |
| Glu Phe Tyr His Pro Ala Gln Glu Tyr Asn Val Arg Val Ala Ser Arg |     |
| 185 190 195   |     |
| tac ttc aag gga cca gag ctc ctc gtg gac tat cag atg tat gat tat | 799 |
| Tyr Phe Lys Gly Pro Glu Leu Leu Val Asp Tyr Gln Met Tyr Asp Tyr |     |
| 200 205 210   |     |
| agc ttg gac atg tgg agt ttg ggc tgt atg tta gca agc atg atc ttt | 847 |
| Ser Leu Asp Met Trp Ser Leu Gly Cys Met Leu Ala Ser Met Ile Phe |     |
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| cga agg gaa cca ttc ttc cat gga cag gac aac tat gac cag ctt gtt | 895 |
| Arg Arg Glu Pro Phe Phe His Gly Gln Asp Asn Tyr Asp Gln Leu Val |     |
| 230 235 240   |     |
| cgc att gcc aag gtt ctg ggt aca gaa gaa ctg tat ggg tat ctg aag | 943 |

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| Arg        | Ile          | Ala         | Lys        | Val         | Leu         | Gly        | Thr | Glu | Glu | Leu | Tyr        | Gly         | Tyr | Leu | Lys |  |      |
| 245        |              |             |            |             | 250         |            |     |     |     | 255 |            |             |     |     | 260 |  |      |
| aag        | tat          | cac         | ata        | gac         | cta         | gat        | cca | cac | ttc | aac | gat        | atc         | ctg | gga | caa |  | 991  |
| Lys        | Tyr          | His         | Ile        | Asp         | Leu         | Asp        | Pro | His | Phe | Asn | Asp        | Ile         | Leu | Gly | Gln |  |      |
|            |              |             |            | 265         |             |            |     |     | 270 |     |            |             |     | 275 |     |  |      |
| cat        | tca          | cgg         | aaa        | cgc         | tgg         | gaa        | aac | ttt | atc | cat | agt        | gag         | aac | aga | cac |  | 1039 |
| His        | Ser          | Arg         | Lys        | Arg         | Trp         | Glu        | Asn | Phe | Ile | His | Ser        | Glu         | Asn | Arg | His |  |      |
|            |              |             | 280        |             |             |            |     | 285 |     |     |            |             | 290 |     |     |  |      |
| ctt        | gtc          | agc         | cct        | gag         | gcc         | cta        | gat | ctt | ctg | gac | aaa        | ctt         | ctg | cga | tac |  | 1087 |
| Leu        | Val          | Ser         | Pro        | Glu         | Ala         | Leu        | Asp | Leu | Leu | Asp | Lys        | Leu         | Leu | Arg | Tyr |  |      |
|            |              |             | 295        |             |             |            | 300 |     |     |     |            | 305         |     |     |     |  |      |
| gac        | cat          | caa         | cag        | aga         | ctg         | act        | gcc | aaa | gag | gcc | atg        | gag         | cac | cca | tac |  | 1135 |
| Asp        | His          | Gln         | Gln        | Arg         | Leu         | Thr        | Ala | Lys | Glu | Ala | Met        | Glu         | His | Pro | Tyr |  |      |
|            | 310          |             |            |             |             | 315        |     |     |     |     | 320        |             |     |     |     |  |      |
| ttc        | tac          | cct         | gtg        | gtg         | aag         | gag        | cag | tcc | cag | cct | tgt        | gca         | gac | aat | gct |  | 1183 |
| Phe        | Tyr          | Pro         | Val        | Val         | Lys         | Glu        | Gln | Ser | Gln | Pro | Cys        | Ala         | Asp | Asn | Ala |  |      |
| 325        |              |             |            |             | 330         |            |     |     |     | 335 |            |             |     |     | 340 |  |      |
| gtg        | ctt          | tcc         | agt        | ggt         | ctc         | acg        | gca | gca | cga | tga | agactggaaa | gcgacgggctc |     |     |     |  | 1236 |
| Val        | Leu          | Ser         | Ser        | Gly         | Leu         | Thr        | Ala | Ala | Arg |     |            |             |     |     |     |  |      |
|            |              |             |            | 345         |             |            |     |     | 350 |     |            |             |     |     |     |  |      |
| tggtg      | cggtt        | ctccacttt   | tccataagca | gaacaagaac  | caaatcaaac  | gtcttaacgc |     |     |     |     |            |             |     |     |     |  | 1296 |
| gtatagagag | atcacgttcc   | gtgagcagac  | acaaaacggt | ggcaggtttg  | gcgagcacga  |            |     |     |     |     |            |             |     |     |     |  | 1356 |
| actagaccaa | gcgaagggca   | gcccaccacc  | gtatatcaaa | cctcacttcc  | gaatgtaaaa  |            |     |     |     |     |            |             |     |     |     |  | 1416 |
| ggctcacttg | cctttggctt   | cctggttgact | tcttcccgac | ccagaaagca  | tggggaaatgt |            |     |     |     |     |            |             |     |     |     |  | 1476 |
| gaagggtatg | cagaatgttg   | ttggttactg  | ttgctccccg | agcccctcaa  | ctcgtcccg   |            |     |     |     |     |            |             |     |     |     |  | 1536 |
| ggccgcctgt | ttttccagca   | aaccacgcta  | actagctgac | cacagactcc  | acagtggggg  |            |     |     |     |     |            |             |     |     |     |  | 1596 |
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| Met        | Ser          | Ser         | Ser        | Glu         | Glu         | Val        | Ser | Trp | Ile | Ser | Trp        | Phe         | Cys | Gly | Leu |  |      |
| 1          |              |             | 5          |             |             |            |     | 10  |     |     |            |             | 15  |     |     |  |      |
| cgt        | ggc          | aat         | gaa        | ttc         | ttc         | tgt        | gaa | gtg | gat | gaa | gac        | tac         | atc | cag | gac |  | 96   |
| Arg        | Gly          | Asn         | Glu        | Phe         | Phe         | Cys        | Glu |     |     |     |            |             |     |     |     |  |      |



|  |     |
|--|-----|
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| 35 40 45   |     |
| gct cta gac atg atc ttg gac ctg gag cct gat gaa gaa ctg gaa gac    | 192 |
| Ala Leu Asp Met Ile Leu Asp Leu Glu Pro Asp Glu Glu Leu Glu Asp    |     |
| 50 55 60   |     |
| aac ccc aac cag agt gac ctg att gag cag gca gcc gag atg ctt tat    | 240 |
| Asn Pro Asn Gln Ser Asp Leu Ile Glu Gln Ala Ala Glu Met Leu Tyr    |     |
| 65 70 75 80  |     |
| gga ttg atc cac gcc cgc tac atc ctt acc aac cgt ggc atc gcc cag    | 288 |
| Gly Leu Ile His Ala Arg Tyr Ile Leu Thr Asn Arg Gly Ile Ala Gln    |     |
| 85 90 95   |     |
| atg ttg gaa aag tac cag caa gga gac ttt ggt tac tgt cct cgt gtg    | 336 |
| Met Leu Glu Lys Tyr Gln Gln Gly Asp Phe Gly Tyr Cys Pro Arg Val    |     |
| 100 105 110  |     |
| tac tgt gag aac cag cca atg ctt ccc att ggc ctt tca gac atc cca    | 384 |
| Tyr Cys Glu Asn Gln Pro Met Leu Pro Ile Gly Leu Ser Asp Ile Pro    |     |
| 115 120 125  |     |
| ggt gaa gcc atg gtg aag ctc tac tgc ccc aag tgc atg gat gtg tac    | 432 |
| Gly Glu Ala Met Val Lys Leu Tyr Cys Pro Lys Cys Met Asp Val Tyr    |     |
| 130 135 140  |     |
| aca ccc aag tca tca aga cac cat cac acg gat ggc gcc tac ttc ggc    | 480 |
| Thr Pro Lys Ser Ser Arg His His His Thr Asp Gly Ala Tyr Phe Gly    |     |
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| Thr Gly Phe Pro His Met Leu Phe Met Val His Pro Glu Tyr Arg Pro    |     |
| 165 170 175  |     |
| aag aga cct gcc aac cag ttt gtg ccc agg ctc tac ggt ttc aag atc    | 576 |
| Lys Arg Pro Ala Asn Gln Phe Val Pro Arg Leu Tyr Gly Phe Lys Ile    |     |
| 180 185 190  |     |
| cat ccg atg gcc tac cag ctg cag ctc caa gcc gcc agc aac ttc aag    | 624 |
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| tgtgttctg ggacctgagg ggtgtggtca gggcacagag actctctcag agcactggga   | 120 |
| gtgggattcc tgctgtaagg gaagggatgt cataggtcag ttgaccaatg accagaccta  | 180 |

|   |            |                     |                     |             |            |     |
|---|------------|---------------------|---------------------|-------------|------------|-----|
| aacatggctc  | ccagccttag | gcatgcggag          | cctaggagtc          | ccttcaaccc  | tggcctgtga | 240 |
| tttttccagc  | tcagatgaca | aagacatcta          | ggcccagtgt          | cttgagaatc  | cctatagtca | 300 |
| aggattagag  | tcctcctcag | tgagtcagct          | cccccagtc           | gtaccctcac  | aagatatcaa | 360 |
| ccgaattcgg  | tttttttttt | tttttttttt          | taaatatgta          | aggctttcaa  | tttattacag | 420 |
| atcacccaag  | aacataatga | tatacatgta          | gtcagaaaac          | acgatgtaga  | aatcatagt  | 480 |
| agttgtccag  | acatagtcag | tagattattc          | tttctggcat          | gctccagtg   | caagacctca | 540 |
| ataaagagca  | ctaaaatcct | tccatacaat          | taagtatcag          | cgatgtacca  | tattgcagaa | 600 |
| aggggtggct  | gagcaacagt | ttgttgatac          | tataagactt          | ccatgctcaa  | cagtcgtagc | 660 |
| gttgcaactca   | gcacagctct | ggtttccata          | tacaaatttt          | ccatctcgta  | ggggagcgcg | 720 |
| gctagtgccg  | ctgccgcttc | caccgcagta          | actgccagat          | cttccaacat  | cacgttcagc | 780 |
| tttgtccgtc  | aacctgtctg | ac atg tcg          | gga ccc gtg         | cca agc agg | gcc aga    | 832 |
|   |            | Met Ser Gly Pro Val | Pro Ser Arg Ala Arg |             |            |     |
|   |            | 1                   | 5                   | 10          |            |     |
| gtt tac aca gat gtt aac aca cac aga ccc cga gag tac tgg gac tat | 880        |                     |                     |             |            |     |
| Val Tyr Thr Asp Val Asn Thr His Arg Pro Arg Glu Tyr Trp Asp Tyr |            |                     |                     |             |            |     |
|   | 15         | 20                  | 25                  |             |            |     |
| gaa tca cat gtg gtg gaa tgg gga aat caa gat gac tac cag ctt gtt | 928        |                     |                     |             |            |     |
| Glu Ser His Val Val Glu Trp Gly Asn Gln Asp Asp Tyr Gln Leu Val |            |                     |                     |             |            |     |
|   | 30         | 35                  | 40                  |             |            |     |
| cga aaa tta ggc agg ggc aaa tac agt gaa gtg ttt gag gcc atc aat | 976        |                     |                     |             |            |     |
| Arg Lys Leu Gly Arg Gly Lys Tyr Ser Glu Val Phe Glu Ala Ile Asn |            |                     |                     |             |            |     |
|   | 45         | 50                  | 55                  |             |            |     |
| atc aca aat aat gaa aaa gtt gtt gtt aaa att ctc aag cca gta aaa | 1024       |                     |                     |             |            |     |
| Ile Thr Asn Asn Glu Lys Val Val Val Lys Ile Leu Lys Pro Val Lys |            |                     |                     |             |            |     |
|   | 60         | 65                  | 70                  |             |            |     |
| aag aag aaa att aag cgt gaa ata aag att ttg gag aat tta aga ggt | 1072       |                     |                     |             |            |     |
| Lys Lys Lys Ile Lys Arg Glu Ile Lys Ile Leu Glu Asn Leu Arg Gly |            |                     |                     |             |            |     |
|   | 75         | 80                  | 85                  | 90          |            |     |
| ggg ccc aac atc atc aca ctt gca gac att gtg aaa gac cct gtg tct | 1120       |                     |                     |             |            |     |
| Gly Pro Asn Ile Ile Thr Leu Ala Asp Ile Val Lys Asp Pro Val Ser |            |                     |                     |             |            |     |
|   | 95         | 100                 | 105                 |             |            |     |
| cga acc cct gcc ttg gtt ttt gaa cat gta aac aac aca gac ttc aag | 1168       |                     |                     |             |            |     |
| Arg Thr Pro Ala Leu Val Phe Glu His Val Asn Asn Thr Asp Phe Lys |            |                     |                     |             |            |     |
|   | 110        | 115                 | 120                 |             |            |     |
| caa ttg tac cag acg tta aca gac tat gac att cga ttt tac atg tat | 1216       |                     |                     |             |            |     |
| Gln Leu Tyr Gln Thr Leu Thr Asp Tyr Asp Ile Arg Phe Tyr Met Tyr |            |                     |                     |             |            |     |
|   | 125        | 130                 | 135                 |             |            |     |
| gaa att ctg aaa gcc ctg gat tat tgt cac agc atg ggg att atg cac | 1264       |                     |                     |             |            |     |
| Glu Ile Leu Lys Ala Leu Asp Tyr Cys His Ser Met Gly Ile Met His |            |                     |                     |             |            |     |
|   | 140        | 145                 | 150                 |             |            |     |
| aga gac gtg aaa ccg cat aat gtc atg att gat cat gag cac aga aag | 1312       |                     |                     |             |            |     |
| Arg Asp Val Lys Pro His Asn Val Met Ile Asp His Glu His Arg Lys |            |                     |                     |             |            |     |
|   | 155        | 160                 | 165                 | 170         |            |     |
| ctt cgg cta ata gat tgg ggt tta gca gag ttt tac cat cct ggc caa | 1360       |                     |                     |             |            |     |
| Leu Arg Leu Ile Asp Trp Gly Leu Ala Glu Phe Tyr His Pro Gly Gln |            |                     |                     |             |            |     |
|   | 175        | 180                 | 185                 |             |            |     |
| gag tat aat gtc cga gtt gct tcc cga tat ttc aaa ggt cca gag cta | 1408       |                     |                     |             |            |     |
| Glu Tyr Asn Val Arg Val Ala Ser Arg Tyr Phe Lys Gly Pro Glu Leu |            |                     |                     |             |            |     |
|   | 190        | 195                 | 200                 |             |            |     |
| ctt gta gat tat cag atg tac gat tat agt ttg gat atg tgg agc ttg | 1456       |                     |                     |             |            |     |
| Leu Val Asp Tyr Gln Met Tyr Asp Tyr Ser Leu Asp Met Trp Ser Leu |            |                     |                     |             |            |     |
|   | 205        | 210                 | 215                 |             |            |     |
| ggt tgt atg ctg gca agt atg atc ttc cgg aag gag cca ttt ttc cat | 1504       |                     |                     |             |            |     |
| Gly Cys Met Leu Ala Ser Met Ile Phe Arg Lys Glu Pro Phe Phe His |            |                     |                     |             |            |     |
|   | 220        | 225                 | 230                 |             |            |     |
| gga cat gac aat tat gat cag ttg gtg agg ata gcc aag gtt ctg gga | 1552       |                     |                     |             |            |     |
| Gly His Asp Asn Tyr Asp Gln Leu Val Arg Ile Ala Lys Val Leu Gly |            |                     |                     |             |            |     |

|   |     |     |     |      |
|---|-----|-----|-----|------|
| 235   | 240 | 245 | 250 |      |
| acg gaa gat tta tat gac tat att gac aag tac aac att gaa tta gat   |     |     |     | 1600 |
| Thr Glu Asp Leu Tyr Asp Tyr Ile Asp Lys Tyr Asn Ile Glu Leu Asp   |     |     |     |      |
|   | 255 | 260 | 265 |      |
| cca cgt ttc aac gat atc ttg ggc aga cac tcc cgt aag cga tgg gaa   |     |     |     | 1648 |
| Pro Arg Phe Asn Asp Ile Leu Gly Arg His Ser Arg Lys Arg Trp Glu   |     |     |     |      |
|   | 270 | 275 | 280 |      |
| cgc ttt gtc cac agt gaa aac cag cac ctt gtc agc ccc gag gcc ttg   |     |     |     | 1696 |
| Arg Phe Val His Ser Glu Asn Gln His Leu Val Ser Pro Glu Ala Leu   |     |     |     |      |
|   | 285 | 290 | 295 |      |
| gat ttt ctg gac aag ctg ctg cga tac gac cac cag tct cgg ctc act   |     |     |     | 1744 |
| Asp Phe Leu Asp Lys Leu Leu Arg Tyr Asp His Gln Ser Arg Leu Thr   |     |     |     |      |
|   | 300 | 305 | 310 |      |
| gca aga gag gcc atg gag cac cct tac ttc tac act gtc gtg aag gac   |     |     |     | 1792 |
| Ala Arg Glu Ala Met Glu His Pro Tyr Phe Tyr Thr Val Val Lys Asp   |     |     |     |      |
|   | 315 | 320 | 325 | 330  |
| cag gct cga atg agt tcg gct ggc atg gca ggg ggc agc aca cct gtc   |     |     |     | 1840 |
| Gln Ala Arg Met Ser Ser Ala Gly Met Ala Gly Gly Ser Thr Pro Val   |     |     |     |      |
|   | 335 | 340 | 345 |      |
| agt agc gcc aat atg atg tca ggg att tct tca gtg cca acc cct tca   |     |     |     | 1888 |
| Ser Ser Ala Asn Met Met Ser Gly Ile Ser Ser Val Pro Thr Pro Ser   |     |     |     |      |
|   | 350 | 355 | 360 |      |
| ccc ctg gga cct ctg gca ggc tca ccc gtg att gct gct gcc aac tca   |     |     |     | 1936 |
| Pro Leu Gly Pro Leu Ala Gly Ser Pro Val Ile Ala Ala Ala Asn Ser   |     |     |     |      |
|   | 365 | 370 | 375 |      |
| ctt ggg ata ccc gta cca gct gcc gct ggc gct cag cag taa tgaccccat |     |     |     | 1987 |
| Leu Gly Ile Pro Val Pro Ala Ala Ala Gly Ala Gln Gln               |     |     |     |      |
|   | 380 | 385 | 390 |      |
| ctgtcttctg atgcctgggc agaggtggga cgtccaccct ctccttaatg cagcttgccg |     |     |     | 2047 |
| ctggttgagg ggggtgagaa cacttcagaa gcaccgtgtc tgaaccgttg cttgtggatt |     |     |     | 2107 |
| tagtagttga gtcataaaaa aaattatagg ctgattttct ttcttttttt tttttttttt |     |     |     | 2167 |
| tttaaaaaaa ccg  |     |     |     | 2180 |

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| cagctccccct tccccgcccc agtcccagtc cccgtccggc cgcggaacata aag atg  | 116         |
|   | Met         |
|   | 1           |
| agt agc tct gag gag gtg tcc tgg att tcc tgg ttc tgt ggg ctc cgt   | 164         |
| Ser Ser Ser Glu Glu Val Ser Trp Ile Ser Trp Phe Cys Gly Leu Arg   |             |
|   | 5 10 15     |
| ggg aat gaa ttc ttc tgt gag gtg gat gaa gac tac atc cag gac aaa   | 212         |
| Gly Asn Glu Phe Phe Cys Glu Val Asp Glu Asp Tyr Ile Gln Asp Lys   |             |
|   | 20 25 30    |
| ttt aat ctt act gga ctc aat gag cag gtg cct cac tat cga caa gcc   | 260         |
| Phe Asn Leu Thr Gly Leu Asn Glu Gln Val Pro His Tyr Arg Gln Ala   |             |
|   | 35 40 45    |
| cta gac atg atc ttg gac ctg gaa cct gat gaa gag ctg gaa gac aac   | 308         |
| Leu Asp Met Ile Leu Asp Leu Glu Pro Asp Glu Glu Leu Glu Asp Asn   |             |
|   | 50 55 60 65 |
| ccc aac cag agt gac ttg att gag cag gcg gcc gag atg ctc tat ggg   | 356         |
| Pro Asn Gln Ser Asp Leu Ile Glu Gln Ala Ala Glu Met Leu Tyr Gly   |             |

|  |     |     |     |      |
|--|-----|-----|-----|------|
|  | 70  | 75  | 80  |      |
| ttg atc cac gcc cgc tac atc ctc acc aac cgg ggc att gca caa atg    |     |     |     | 404  |
| Leu Ile His Ala Arg Tyr Ile Leu Thr Asn Arg Gly Ile Ala Gln Met    |     |     |     |      |
|  | 85  | 90  | 95  |      |
| ttg gaa aag tac cag caa gga gac ttt ggc tac tgt cct cga gta tac    |     |     |     | 452  |
| Leu Glu Lys Tyr Gln Gln Gly Asp Phe Gly Tyr Cys Pro Arg Val Tyr    |     |     |     |      |
|  | 100 | 105 | 110 |      |
| tgt gag aac cag ccg atg ctt ccc atc ggc ctt tcg gac atc cca gga    |     |     |     | 500  |
| Cys Glu Asn Gln Pro Met Leu Pro Ile Gly Leu Ser Asp Ile Pro Gly    |     |     |     |      |
|  | 115 | 120 | 125 |      |
| gag gcc atg gtg aag ctc tac tgc ccc aag tgc atg gac gtg tac aca    |     |     |     | 548  |
| Glu Ala Met Val Lys Leu Tyr Cys Pro Lys Cys Met Asp Val Tyr Thr    |     |     |     |      |
|  | 130 | 135 | 140 | 145  |
| ccc aag tcc tct agg cac cac cac acg gat ggc gca tac ttc ggc act    |     |     |     | 596  |
| Pro Lys Ser Ser Arg His His His Thr Asp Gly Ala Tyr Phe Gly Thr    |     |     |     |      |
|  | 150 | 155 | 160 |      |
| ggg ttc cct cac atg ctc ttc atg gtg cat ccc gag tac cgg ccc aag    |     |     |     | 644  |
| Gly Phe Pro His Met Leu Phe Met Val His Pro Glu Tyr Arg Pro Lys    |     |     |     |      |
|  | 165 | 170 | 175 |      |
| cgg ccg gcc aac cag ttt gtg ccc agg ctc tac ggt ttc aag atc cat    |     |     |     | 692  |
| Arg Pro Ala Asn Gln Phe Val Pro Arg Leu Tyr Gly Phe Lys Ile His    |     |     |     |      |
|  | 180 | 185 | 190 |      |
| cca atg gcc tac cag ctg cag ctc caa gcc gcc agc aac ttc aag agc    |     |     |     | 740  |
| Pro Met Ala Tyr Gln Leu Gln Leu Gln Ala Ala Ser Asn Phe Lys Ser    |     |     |     |      |
|  | 195 | 200 | 205 |      |
| cca gtc aag acg att cgc tga gtgccctccc acctcctctg cctgtgacac cacc  |     |     |     | 795  |
| Pro Val Lys Thr Ile Arg  |     |     |     |      |
|  | 210 | 215 |     |      |
| gtccctccgc tgccaccctt tcaggaagtc tatggttttt agtttaaatt aaaggaattg  |     |     |     | 855  |
| ttactgtggt ggggatatga aataaaggaa gagaaggcta aaaaaaaaaa aaaaaaccga  |     |     |     | 915  |
| attcggcatc tcacctaggt gtatacagct gcacattacc aatggctgca gaacacccaa  |     |     |     | 975  |
| tcatgacctc tagtgcttta tagcaaaagt gtaaagtggg acctgggtga ccagcattgc  |     |     |     | 1035 |
| catggttaca tccatttgcg taatcaagca gctgtgcaac tgctcttcta acagatgaac  |     |     |     | 1095 |
| agctgcatgc atctccagca ggcatggatt gtctcttgct tatgatcctc agtgcgttca  |     |     |     | 1155 |
| cttagagtat ttctagagtt tgagtccttg ccgtgataga gccatgtagg gaatgactg   |     |     |     | 1215 |
| attgcatggt accccaagcg tcatgaaacc ttccgacacg gtgacctatt taatggctct  |     |     |     | 1275 |
| gtttgttgac atgacaaatt aacattctta gagttacatc tcgaaaaaag catttgtgat  |     |     |     | 1335 |
| agataagccc tttagagcctt gtggctaaat ttttgtggct ttgtttaact ttcaaagggt |     |     |     | 1395 |
| atatatgcac taaccttttt tgatggctaa gtaggcttta aattacagta aattttttca  |     |     |     | 1455 |
| aataaaaactg gctgtaaaat atattttgaa ttagagttgt tcactttttc atagctactt |     |     |     | 1515 |
| atgttttttt cccaataatt tatttcacat ctctaccagt gaacgcagcc catcactaga  |     |     |     | 1575 |
| aaatgacctt gtcctgattt cagtttcaac tattagtttt aaagctcact gttgaataag  |     |     |     | 1635 |
| aggaagtggg ggtgcatttt aaattgactt tcatgtgctt ttaaaatatg acagatctcc  |     |     |     | 1695 |
| ttgataatgt acttttattt gatctcaagt tgtataaaac caataaaattt gtgttacttt |     |     |     | 1755 |
| gattgcagta gtatcttatg catagtgatt ccatgttata tgcagactag ttaggcaact  |     |     |     | 1815 |
| gttttcttag ttacaagctt cacttttgtg cagttaaaaa aacaaaagta ggctacagtc  |     |     |     | 1875 |
| tgtgccatgt tgatgtacag tttctgaaat tgttttacia gactttgata ataaaaccct  |     |     |     | 1935 |
| taaactcaca aaaaaaaaaa aaaaaaacc                                    |     |     |     | 1964 |

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21

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kinase 2 beta subunit RNA

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 kinase 2 activity

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 kinase 2 activity

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24